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Ten per cent. More

The steel industry last year made 12½ million tons of steel for ingots and castings and Sir Stafford Cripps at a Press conference last Monday indicated that the target for 1948 was 14 million. It can be assumed that this production, to be effective, must be supported by a *pro-rata* increase in castings—especially cast iron. The construction of ships, railway wagons, steel rails, agricultural and general machinery demands a quota of iron castings before the steel can be usefully put into service. Whilst it may not be an arithmetical ratio, owing to the proposed reduction in building and other factors, yet to make it possible effectively to use 14 million tons of steel, the production of iron castings must be raised. Last year, it is thought that the production was not far short of 3 million tons. To take care of an extra million and a half tons of steel will require a minimum of 300,000 of castings for its effective consumption. This figure may be difficult to achieve, as in some cases ironfounding is in competition with the blast furnaces for metallurgical coke and other raw materials. Moreover, some kinds of steel demand much cast iron for completion into an article of commerce, whilst others but very little.

It is possible to estimate the prospects for the ironfounding industry from Sir Stafford Cripps' statement. First, engineering and the makers of motor vehicles are to receive rather more than in 1947. Agricultural machinery manufacturers will get a substantial increase, whilst the Ministry of Transport is similarly treated. Mining equipment is to be stepped up, and it, too, will require more castings. Power station equipment makers are to get "a very substantial excess over 1947 deliveries." On the other side of the picture, there are to be reductions in the amount of steel going into the construction of new buildings and ships. The former is substantial, but the latter only of a minor character. It seems that whilst shipping is a dollar "earner," the dollar "savers" have received a preference on the balance. The gas industry, too, is to receive slightly less steel this year. We are somewhat concerned as to the reliability of any planning which fundamentally assumes that steel (or iron castings, for that matter) can be transferred from one industry to another. For instance, the lowered quota of steel to be accorded to the shipbuilding industry can be assumed to be heavy ships' plates, heavy forgings and so forth. Large and small iron castings are also demanded for shipbuilding. Now agriculture implement makers require quite a different sort of steel, whilst its needs for castings are met by repetition foundries. Again we doubt if the type of steel used by gasworks will, if reduced, go to swell the requirements for the more favoured industries. In plain English neither steelworks nor foundries—except in a limited field—work for all industries.

On the general situation, Sir Stafford Cripps said that the prospects for both coke and scrap had both improved during recent weeks. The mines are now producing the 12 million tons of coal needed for coking. The scrap campaign has been successful and deliveries are 10 per cent. better than a year ago. There is a hope that we may get supplies from Germany. The plan for the future involves a 16 million ton output and the question of its economic disposal was answered by reference to the American production of 75 million tons of steel per annum with a population of 120 millions, which gives a far higher *per capita* production than the U.K., which latter is more highly industrialised as related to the whole economy. Thus the foundry industry can envisage a corresponding expansion during the next few years.

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Latest Statistics

The Monthly Statistical Bulletin issued by the British Iron and Steel Federation for December confirms our conjection that there was a heavy intake of labour into the ironfoundries during September. The statistics show that in September the overall labour force grew by 3,266 to 139,965. There has been an increase during the year of 12,000, or 9.4 per cent. The entry of women workers was, during September, 136, or for the whole year only 178. Thus the year has seen a reduction from 7 per cent. to 6.4 per cent. of women workers as related to the total employed.

The weekly average production of steel for steel castings for November was of the order of 8,000 tons, as against 7,700 tons in October and 7,400 tons a year ago. The weekly deliveries in November averaged 4,300 tons, as against 3,900 tons in October. If our arithmetic is correct and the figures are relative, they show that the loss between the liquid steel and the finished castings was 49.4 per cent. in October and was reduced to 41.5 per cent. in November—a creditably-low figure.

Ealing Park Presentation

LAST FRIDAY, at the Ealing Town Hall, Mr. V. Jobson presented clocks to 21 of the staff of Ealing Park Foundry. Each recipient had been with the company for more than 20 years. In his address Mr. Jobson said that the Qualcast group was producing about 600 tons a week of finished castings, and that all the firms within the group were registering record productions. Mr. R. B. Templeton, the managing director and vice-president of the Institute of British Foundrymen, presided. Amongst the guests present were Mr. J. Shaw, chairman of Allied Ironfounders. Mr. V. C. Faulkner, editor of the FOUNDRY TRADE JOURNAL, and Mr. Collins, the London organiser of the Amalgamated Union of Foundry Workers.

British Standards Institution

The Monthly Information Sheet for November, 1947, just received, lists under the heading of Future Publications, No. 1121:1947, Methods for the analysis of steel, Part 2: Nickel in permanent magnet alloys, 2s.; and No. 1430:1947, Aluminium rainwater goods (cast and extruded), 2s. 6d.

Amongst new work started there are domestic oil burning appliances, aluminium and aluminium alloy windows, tensile testing of metals, and revision of B.S. 18.

Professor Eugen Piwowarsky of the University of Aix la Chapelle, when recently on a visit to this country, told us that the Gelsenkirken company, a large concern which casts spun iron pipe, is once again in commission. The pipes, however, are being cut into short lengths for the manufacture of hundreds of thousands of bodies for domestic heating stoves. Not a bad idea!

Forthcoming Events

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

JANUARY 19.

The Association of Bronze and Brass Founders.

Yorkshire Area:—Regional Meeting at the Great Northern Hotel, Leeds, at 12.45 p.m.

JANUARY 20.

Institute of British Foundrymen.

Slough Section:—"Open Discussion" at the Lecture Theatre, High Duty Alloys, Limited, Slough, at 7.30 p.m.

The Chemical Engineering Group.

"Abrasion, Erosion, and Corrosion," by Dr. C. H. Desch, F.R.S., at the apartments of the Geological Society, Burlington House, Piccadilly, London, W.1, at 5.30 p.m.

JANUARY 21.

North Western Fuel Luncheon Club.

Luncheon at 12 noon for 12.45 p.m. (previously announced for January 14). Speaker, A. L. Horner, Gen. Sec., National Union of Mineworkers, at the Engineers' Club, Albert Square, Manchester. Subject: One Year of Nationalisation.

Institution of Production Engineers.

Birmingham Section:—"Developments in Induction Heating," by E. May, B.Sc., at the James Watt Memorial Institute, Great Charles Street, Birmingham, at 7 p.m.

JANUARY 23.

The Association of Bronze and Brass Founders.

Lancashire and Cheshire Area:—Regional Meeting at the Midland Hotel, Manchester, at 2.30 p.m.

Manchester Association of Engineers.

"Developments in Shot-blasting," by R. Ankers, at the Engineers' Club, 17, Albert Square, Manchester, at 6.45 p.m.

Sheffield Society of Engineers and Metallurgists.

Joint Meeting with the Sheffield Section, The Institute of Metals. "Some Metallurgical Problems in the Field of Atomic Energy," by E. W. Colbeck, M.A., at the Royal Victoria Hotel, Sheffield, at 6.15 p.m.

Institution of Mechanical Engineers.

The Thomas Lowe Gray Lecture: "Gas Turbine and Marine Propulsion," by T. A. Crowe, M.Sc., at 5.30 p.m., at Storey's Gate, St. James' Park, London, S.W.1.

JANUARY 24.

Institute of British Foundrymen.

Bristol and West of England Branch:—"Bronze Castings," by J. L. Howard, at the Grand Hotel, Broad Street, Bristol, at 3 p.m.

Institute of Mechanical Engineers.

Graduates Section, London:—"The Engineer and Steelmaking," by A. Roebuck, at Storey's Gate, St. James' Park, London, S.W.1, at 3 p.m.

Rusting of Chilled Grit

When asked over the telephone how to prevent chilled iron grit from rusting, we suggested that it should be stored in a dry place, but our inquirer insisted that, despite such conditions, rusting did occur. One leading founder states that his foreman takes out, and uses first from each new delivery of grit, bags which have become damp. The rest is stored on a concrete floor and no further trouble is encountered. Other views from makers and users are invited.

The Alphabetical Index for the FOUNDRY TRADE JOURNAL, vol. 82 (May to August, 1947) is now available. Will readers who require copies make early application to 49, Wellington Street, London, W.C.2.

Mechanisation of Non-ferrous Foundries*

Application to Copper- and Nickel-base alloy foundries with special reference to personnel

By G. Skript

Introduction

The mechanisation of non-ferrous foundries is a vast subject, and it is deemed to be desirable to outline the extent of the Paper more precisely. The basic principle of mechanisation is similar in every foundry whether steel, iron, light alloy or bronze—the variations are mainly imposed by the degree of mechanisation, *i.e.*, in most cases, by the difference in market requirements and a few peculiarities of processes inherent in the manufacture of one or the other type of alloy. Therefore, the first step in every mechanisation is to decide on a flow in accordance with the output requirements and certain peculiarities of the process, and then to determine the extent of mechanisation in accordance with economic considerations, labour market, availability of space, etc. Quite recently an excellent Paper was given by Mr. R. C. Shepherd before the Annual Conference of the Institute of British Foundrymen, which dealt with production flow in mechanised foundries, therefore it is proposed only to touch upon this subject occasionally and to deal with the peculiarities of the flow as dictated by special requirements of non-ferrous foundries, and where this term is used it is meant to imply foundries casting copper- and nickel-base alloys. An attempt will be made to say when there is a case for mechanisation and how to decide on the extent of it.

What is Mechanisation?

The mere fact of installing moulding machines, sand preparing plant, and even a few roller conveyors does not justify calling the unit a mechanised foundry. Modern thinking of the management and the operatives, an open mind in approaching production problems, the establishment of production rhythm supplemented by mechanical handling equipment, constitute the background of a mechanised production unit. Ford said in his book that his motto is "everything can be made better still, than hitherto," and, if such an approach is adopted, the first step to the success is secured.

The mechanisation of the foundry could be divided into the following elements:—

Mechanisation of means of production to include mechanical sand preparation; moulding machines and Sandslingers; mechanical shake-out of moulds; core-blowers and other core-making machines; continuous drying of moulds and cores; and various fettling machines.

Mechanisation of transport to include transport of sand to moulding machines; transport of sand to core benches; transport of cores to the moulds; transport of cast moulds to the shake-out; transport of castings to and through the fettling shop; return of the sand to the sand preparing plant; return of moulding boxes from the shake-out to the moulding machines; and transport of metal to the moulds.

Only if all these facilities work together in harmony without bottlenecks, if the semi-continuous or continuous production process is meticulously planned and carried out, is there a justification of calling a foundry a mechanised unit.

Advantages and drawbacks of Foundry Mechanisation

Amongst the advantages are:—Fewer man-hours for the same output; unskilled and semi-skilled labour instead of skilled; less fatigue; less space for the same output; easier control of standardisation of processes, consequently elimination of human element; and a more uniform product as far as dimensions and quality are concerned.

The disadvantages include:—Less elasticity of production (changes in planning are difficult), all sections must be permanently balanced; in most cases a larger pattern shop is required; higher grade supervision and larger planning staff are necessary; a breakdown of one section may create a considerable dislocation and lead to loss of production; and a larger and more experienced engineering staff produces higher standing charges, and therefore a danger of losses at insufficient occupation.

It is often assumed that a foundry full of mechanised gadgets must be efficient, and it is only the question of capital outlay to provide them. A personal opinion is that more inefficiency is possible in a mechanised foundry than in a non-mechanised foundry. The author has seen mechanisations where the machines were in the way of the conveyors, conveyors in the way of machines, and the whole lot in the way of a bewildered labourer pushing his way with his sack barrow through the glorious chaos. To make a mechanised foundry efficient, a much more efficient and knowledgeable management is required. It has been said that the efficiency of the foundry is determined by the layout. This is true to a degree, but even a well-thought-out layout must be operated properly, and this is the function of the management. Yet the ever-increasing scarcity of skilled labour, the rising wages and the tendency for producing larger quantities of standard articles for the competitive market, will make the mechanisation more and more needful in wider circles of engineering foundries.

*A Paper read before a joint meeting of the London branch of the Institute of British Foundrymen and the Institute of Metals.

Non-Ferrous Foundry Mechanisation

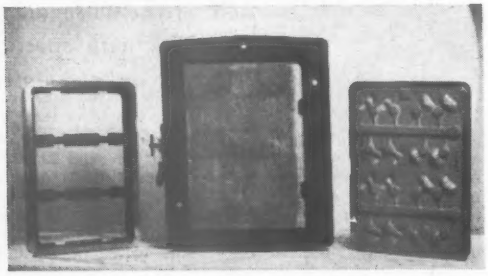

FIG. 1.—PARTS FOR A MOULDING MACHINE PLASTER PATTERN PLATE.

Case for Mechanisation

While foundries producing standard articles, such as water or gas fittings, water-meters, bearings, etc., are often already mechanised, modern jobbing foundries are beginning to show a trend towards mechanisation. There is no doubt that a carefully planned degree of mechanisation can be successfully applied to jobbing foundries producing a not very large quantity of repetition castings.

If the type of work and the quantities required are such that one pattern plate could be kept going one whole day, the mechanisation of a foundry is, as a rule, justified. Even three or four pattern changes per day could qualify a foundry to be mechanised without jeopardising its efficiency or cost of production.

Approach to Mechanisation

The two main requirements for mechanisation are: a well-equipped and an efficient patternshop and a high degree of skill in planning of production. One of the first technical problems to be tackled when mechanising a foundry is the creation of a single all-purpose floor sand. It is always possible to devise a best sand mixture for a given alloy and type of castings produced. If a large variety of different alloys is made, it is advisable to standardise on a single sand mixture which will give satisfactory results for all the alloys cast, whether dry or green, hand or machine moulded. There is one mechanised foundry which installed a very elaborate sand distribution scheme with two hoppers to each machine, but the rhythmic flow of production was not obtained until there was standardisation on one sand only. The mixture shown in Table I gives satisfactory results for alloys ranging from brass, gunmetal and phosphor bronze to aluminium bronze, pure copper and nickel-base alloys, such as pure nickel, Monel, nickel-chrome, etc. If the range of alloys produced is less wide and they are of the gunmetal type, a more plastic sand may be used which will require less ramming and consequently will speed up the production.

TABLE I.—*Universal Moulding Sand.*

Tests carried out in accordance with A.F.A. testing procedure.	
Moisture, per cent.	6.3
Green compression	6.9 lbs./sq. in.
Green permeability	29.9
Dry ,, ...	37.7
Dry compression	105 lbs./sq. in.
Sieve Test.	
1.9 per cent. retained on B.S. Sieve	No. 10.
1.4 ,, ,, ,, ,,	No. 22
1.0 ,, ,, ,, ,,	No. 30
3.7 ,, ,, ,, ,,	No. 44
4.3 ,, ,, ,, ,,	No. 60
29.2 ,, ,, ,, ,,	No. 100
23.2 ,, ,, ,, ,,	No. 150
12.5 ,, ,, ,, ,,	No. 200
6.1 per cent. passed through ,,	No. 200
14.2 per cent. separated clay.	

It is important that the sand preparation should not crush the sand grain, as this may cause casting defects, or, if a desilting plant is provided, an undue loss of sand. If an efficient sand mill be installed, the principal cause of sand loss will be due to burning. The burnt clay must be supplemented by adding bentonite. A certain amount of new sand is used to replace waste and maintain a suitable grain size.

When laying out a mechanised plant, it is important to provide adequate sand storage hoppers to allow the sand to cool, and acquire uniform moisture. In case dry sand is used, it is advisable to spray it with water before storing it—this gives more uniform distribution of moisture and better bond due to swelling of the colloidal clay.

Moulding

The selection of moulding machines depends largely on the output required and the type of castings to be produced. The hand ramming or hand squeezing machines are commonly used when a high rate of production is not required. For larger production, power-operated machines of the squeeze and jolt-squeeze type are preferred. The three main types of machines used are machines lifting the flask, machines dropping the pattern plate and roll-over machines. They can be

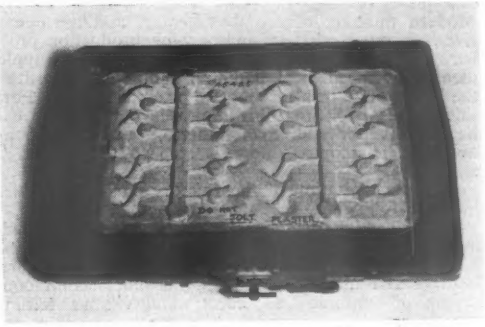

FIG. 2.—COMPLETED MOULDING MACHINE PLASTER PATTERN PLATE.

provided with jolt and squeeze, jolt only or squeeze only. Each type has its merits, but a critical survey is outside the scope of this Paper.

The power-operated ram machines must have a powerful blow to give hard enough ramming to prevent burning-in on the vertical surfaces, particularly if sand with high permeability be used. The modern tendency in the development of moulding machines is towards automatic operation. A push-button starts up the automatic cycle of jolt, squeeze and lift until the complete box is ready to be deposited on the conveyor.

It is advisable whenever possible to use metal pattern plates, as wood or plaster plates produce a damping effect diminishing the force of the blow. However, for shorter runs a wooden or plaster plate is a useful and inexpensive equipment. Plates made in plaster, stone, wax, etc., could be made to fit one frame. Fig. 1 shows the parts of such a pattern plate and Fig. 2 the completed plate. Wooden patterns could be inexpensively plated on wooden plates if they were fixed with one pin on both sides of the plate. This method can only be used, however, if the machine table is hollow.

How many complete moulds could be produced on one machine per day is a very difficult question to answer without knowing the type of work to be moulded. In most cases the limitation will be not the speed of production of moulds, but the closing, the pouring, the length of conveyor, etc., anything between 1 min. and 4 min. for a complete mould is a normal time. With modern automatic machines shorter times are possible. Steel flasks are the usual moulding equipment, snap flasks are applied successfully under certain conditions. If the pressure of metal is not excessive and the number of castings in one mould not too large, the use of snap flasks is recommended. The advantage of a snap flask is obvious, small capital outlay, small maintenance cost, no return of flasks is required, and knocking out is easy. When using the snap flasks the closing and pouring cycle for moulds containing cores must be meticulously planned to avoid leaving the cores too long in a closed mould, which might lead to defects.

Whatever flasks be used, much trouble will be saved if they are maintained in a good condition. It is better to start the maintenance on the foundry floor by ensuring that the flasks are not mishandled at the knock-out. Mechanical shake-outs can be provided, but if the knock-out is not centralised and one knock-out has to be provided for each conveyor, the cost might become considerable.

Core-shop

One of the frequent bottlenecks in a mechanised jobbing foundry is the core-shop. It is not an easy task to plan a core-shop with an adequate capacity to meet changing demands. Many cores can be made on core-blowers, provided the quantities warrant a suitable core-box and dryer equipment. Cast-iron core-boxes prove their value in a long run, but zinc and aluminium alloy core-boxes are commonly used.

It has been claimed that wooden boxes can be used in some cartridge blowers. The Author saw a small cartridge bench blower in the U.S.A. last year and heard much praise from people using it. The oil-bonded sand has proved its value for blown cores—a typical mixture is:—80 to 90 parts sea sand; 10 to 20 parts Mansfield sand; 2 to 3 parts semi-solid mixture; and 1 to 1½ parts oil. This core is comparatively easy to handle when green and can be easily removed after casting.

One of the most important items of plant in a mechanised core-shop is the drying oven. A continuous stove has proved its worth in many mechanised plants; standard conditions of drying are easily maintained; it is easy to fit into the flow of production and occupies little floor space.

As the economic batches in production of cores are frequently not the same as in the production of moulds and the moulds can often be made quicker than the corresponding number of cores, it is advisable to make the cores in advance. This requires a dry storage space. The storing oven illustrated in Fig. 3 requires little floor space and is capable of storing a considerable quantity of cores not required for immediate production. A push-button operates the movement of a selection gear and the required tray can be brought into position for the removal of cores.

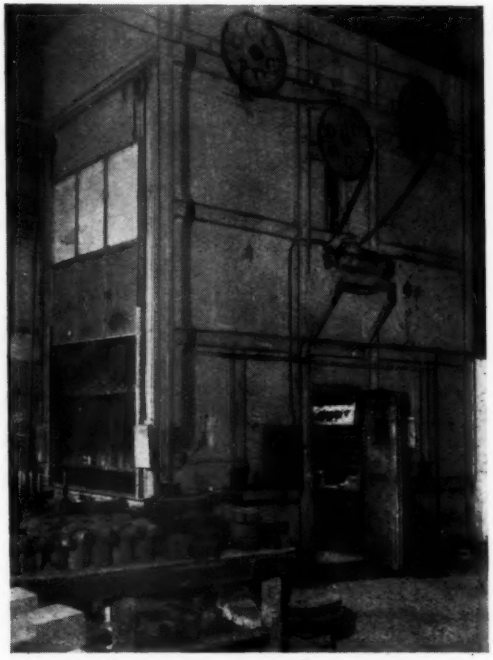

FIG. 3.—CORE STORAGE OVEN.

Non-Ferrous Foundry Mechanisation

Melting

To maintain a flow of production the metal must be always available. Too long a period between casting will cause overflow of conveyors and hold-ups. Moulds being closed for too long a period may cause blowing off the cores; it is therefore important that no hold-ups due to shortage of metal should occur. The choice of furnaces depends to a large degree on the type of metals to be cast. If ingots or virgin materials are used, an indirect arc furnace, shown in Fig. 4, is very effective. It is suitable for most alloys produced in a non-ferrous foundry, and it is clean, fast, and easy to handle.

Two rocking arc furnaces, on an average, can serve three moulding machines. The number of different alloys manufactured affect the number of furnaces to be installed. The rocking arc furnace creates a one-phase load and a special precaution has to be taken not to embarrass the electricity supply concern. If a lower grade of scrap or swarf is used, and a certain amount of refining is necessary, such as removal of aluminium, iron, silicon, phosphorus, etc., by means of slag treatment, then a rotating furnace, shown in Fig. 5, is more suitable. It is economical to use, the oil consumption is 8 to 12 per cent. by weight of metal melted. If proper technique be applied, the metal losses can be kept below 1 per cent. and metal of excellent quality can be obtained.

FIG. 4.—INDIRECT ARC FURNACE.

Crucible furnaces are still widely in use, particularly when many different alloys are cast, and when electric furnaces, due to uncertain load factor, could not be economically employed. If one alloy only is cast cupolas are sometimes installed, but personally the Author doubts their justification.

Fettling

In various American factories the Author visited last year, he found git cutters situated near the knock-out. This arrangement eliminates the transport of runners and risers to the fettling shop and back to melting. Band saws are still widely used, but abrasive cutting machines are becoming the standard equipment of every fettling shop. The cutting-off machine shown in Fig. 6 is very rapid, and is suitable for most shapes as produced in a jobbing mechanised foundry.

Circular saws are occasionally used for larger castings, but they are rather clumsy for the varying shapes in a jobbing foundry, and are used only for a simple shape or for larger castings. The double-ended grinder, supplemented by flexible shaft or air-operated grinders, is a standard equipment of a fettling shop. In a well-run mechanised foundry, particularly on a long-running job, where pattern costs are not of major importance, bench fettling is reduced to a minimum. A few bench fettlers are usually employed to correct errors due to incorrect ramming and closing.

The choice of shot-blast equipment depends mainly on the type of castings manufactured. As a rule, a barrel for smaller, and a table for larger, castings is used.

One of the essentials of a mechanised foundry is well distributed and freely available compressed air. Compressed-air points must be at hand on the closing stations and for burners for ladle preheating in addition to requirements for air-operated plant and equipment.

Transport

One of the most wasteful items in a non-mechanised foundry is transport. Transport of sand from sand-preparing plant to the moulders in a barrow is a trying operation and, if moulding machines are used, the task becomes formidable. For instance, for six machines each making 300 complete boxes a day, or 600 parts 12 in. by 18 in. by 4 in. each, 1,800 cub. ft. of compressed or 2,200 cub. ft. of loose sand is required daily; assuming that one barrow takes 2½ cub. ft. per journey, the number of journeys per day would be 880. This means that five to seven men should be employed for this unthankful task. It would be unavoidable that some of the machines would be starved of sand from time to time. The sand placed in a heap will dry more rapidly and varying moisture content may cause scrap. The shovelling of sand from the floor into the flask is a fatiguing operation, particularly if it has to be performed the whole day long.

As an interim solution, one foundry made benches of the same height as the moulding machine, thus making the shovelling operation less strenuous, and the sand was distributed by a mono-rail carrying a grab.

FIG. 5.—OIL-FIRED ROTATING FURNACE.

The proper solution is a complete sand distribution plant consisting of storage hoppers, sand mills, bucket conveyor, sand hoppers, and an apron conveyor returning the sand from the knock-out to the mill. Such an installation saves room, time and physical effort.

The cast moulds are knocked out on a grid, and the sand is returned to a storage hopper; on the way the sand is moistened, de-silted and passes over a magnet which removes sprigs and core-wires. The sand distribution in the core-shop, if mechanised, is made by means of tubes or travelling buckets which are tipped by the operatives as required.

If the layout is made for a standard product, a travelling plate or bucket conveyor could be used. Such a layout, however, is not very elastic and, if variations in moulding times per complete box are considerable, it may lead to difficulties. One of the most simple and effective layouts in a jobbing foundry is a straight roller conveyor which stretches from the moulding machine to the knockout. The return conveyor returns the flasks to the machine. The height of the conveyor depends on the flask used, whether cast with a cup, whether an overhead casting rail is available, etc., heights of 12 to 14 in. are quite common. The height is convenient for coring up and still allows the cope to be closed without undue strain. For casting tin bronzes and straight brasses, the conveyor should be slightly inclined to facilitate the running of metal.

A simple arrangement of two rails placed on a few bricks can make a good pouring station; although such an arrangement does not reduce the transport cost, it helps good housekeeping.

If snap flasks are used, a simple gadget as shown in Fig. 7 can facilitate the knocking-out. For steel flasks more elaborate shake-outs are used, but the installation is costly if it has to be provided at the end of each conveyor.

Metal distribution is effectively carried out by using mono-rails. It is important that the mono-rails should not be fixed too low, as this makes the pouring insufficiently flexible. If enough head room is not available, the flexibility can be considerably improved by the introduction of transporter cranes matching the mono-rail. They are, however, expensive and require an extra man to operate them. A one-man pouring-ladle is a convenient way of casting. It is important to take care of the continuous preheating of ladles, as this is often overlooked and results in a bottleneck. The size of the ladle must be carefully selected for local conditions in order to avoid the dropping below the safe range of the temperature of the metal.

The mechanisation of fettling-shop transport is not an easy matter. If the foundry produces a more or less uniform size of castings, mechanisation can be successfully operated. A conveyor distributes bins containing castings to the cutting-off machines, grinders and bench fettlers. The cutting-off machines shown in Fig. 6 are used on the three-bin system, one bin containing uncut sprues, another containing the cut-off castings, the third one runners and risers. The castings are moved to the grinders, hand fettlers, sand blast and out to inspection. The process scrap is returned to the stores. The empty bins are sent back to the knock-out. Two conveyor-covered trolleys make the layout flexible, allowing the bins to be brought forward at will.

This brief survey of foundry mechanisation plant concludes the technical aspect of the Paper.

The Human Problem of Mechanisation

The human problem in a mechanised foundry is somewhat different from that of a shop employing skilled craftsmen, as semi-skilled operatives are employed in a mechanised plant. It is manual dexterity and physique rather than skill that matter. Much is

FIG. 6.—FETTLER USING A CUTTING-OFF MACHINE ON THE THREE-BIN SYSTEM.

Non-Ferrous Foundry Mechanisation

being written about the effect of monotony in the operation of mechanised plant, and its result of high labour turnover and decrease in efficiency. The investigations in various factories have shown that the operatives for repetition work must be carefully selected. Different temperaments and different grade of intelligence among the operatives react differently to the conditions of work in a mechanised plant. There is frequently a tendency on the part of the manager to select the most intelligent and ambitious type of man for every job. This often proves fatal. The effect of boredom, if the selection of operatives has been carried out intelligently, is frequently over-rated.

S. Wyatt and Langdon, who carried out a number of investigations, say in their report (No. 77—Fatigue and Boredom in Repetitive Works): "Some individuals prefer work which needs no thought or responsibility;

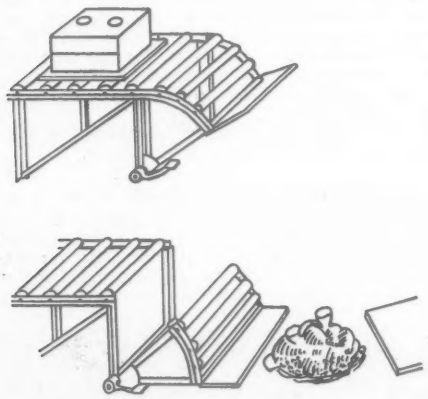

FIG. 7.—ARRANGEMENT FOR AUTOMATIC KNOCK-OUT OF SNAP-FLASK MOULDS.

these individuals are usually below the average in intelligence. Conversely, severe boredom is usually found associated with more than average intelligence." Some others, being of an average intelligence, are capable of detaching their mind from work; they do not object to, and even like, repetition work and certainly prefer it to jobs which require concentration and responsibility. Short breaks, cheerful canteen atmosphere and social activities outside the factory hours assist in breaking the monotony of mechanised operations.

As distinct from monotony, physical fatigue must carefully be avoided. It is obvious that in a well-laid-out mechanised foundry, where the operative does not need to exert himself physically, where lifting, carrying, hand ramming, etc., is entirely eliminated or reduced to a minimum, the fatigue is less pronounced than in the non-mechanised foundries.

The height of the conveyors, the position of pouring gantries, the distances the men must walk, if carefully planned, can contribute towards the reduction of fatigue.

Good lighting and ventilation and an occasional coat of paint will reduce mental fatigue still further and will create a cheerful atmosphere. The Author still remembers the old brass foundry where the zinc fever was a common occurrence and was considered to be a part and parcel of the trade. The modern foundry ventilation system must change the air at least 20 to 30 times per hour. It must not be forgotten to introduce fresh air at a suitable place. These air changes do not leave fumes hanging around for any length of time. Apart from general ventilation of the shop, it is advisable to provide local ventilation at the knock-out and the sand-distribution gantry, in addition to that of the melting shop. If a special pouring station is provided, the ventilation of it is advisable, particularly if brass or leaded bronze be cast.

One of the important problems in a mechanised foundry is the planning and training. Ford said "the training for a job requires for 43 per cent. of the tasks no more than one day, for 36 per cent. one to eight days, for 6 per cent. one to two weeks, for 14 per cent. one month to a year, and for 1 per cent. up to six years."

It is this "1 per cent." which contributes so much towards the success or failure of a mechanisation project. There are still very few facilities available for training foundrymen for running a mechanised plant, with the result that many a mechanised plant is full of labour-saving devices and clever gadgets, but the rhythm of production (which is an essential for a successful mechanisation, and may account for as much as 15 per cent. of the total output) does not exist.

It is important that the supervisors be not only capable of planning the work, but they must also be able to train the personnel in their jobs. There is always a certain labour turnover and the training of green labour must be carried out continually. An excellent contribution towards a good training scheme was made by the Ministry of Labour in starting "Training within Industry" courses. A well-laid-out training programme for every job, perhaps strengthened by films or slides, can assist the success of a mechanised plant, save scrap, avoid damage to plant and equipment, and it will certainly save time of the supervisory personnel in the long run.

Maintenance System

When one decides to mechanise, it is important to set up an organisation for maintenance of plant and equipment. A preventive maintenance is better than the curative type. The number of men required for maintenance varies, of course, with conditions, but a plant, as described above, with five moulding machines, requires one full-time semi-skilled man for adjustments and lubrication, one skilled man 20 hours a week and

one electrician 2 hours a week. One man is fully employed on re-conditioning of flasks, unless snap flasks are used. The power requirement of the completely mechanised sand-distributing scheme is in the region of 60kVA; this figure excludes light and compressed air.

A complete foundry, as described above, excluding building and ventilation, would cost to-day £25,000 to £30,000, and is capable of producing 20 to 30 tons per week, dependent upon the type of work. It is difficult to assess the number of men required, as it depends so much on the type of work, layout, etc., but the whole moulding and closing would be carried out by 10 to 14 men. The figure of output quoted above can be considerably augmented if large quantities of similar types of castings are required, or if the average weight of castings per box is high.

The Americans claim to mechanise the sand preparation and distribution and the metal distribution at a cost of £600 to £1,250 per moulding machine. Small mechanised plants in this country are available at a cost of £3,000 to £5,000.

Envisaging a Mechanisation Scheme

To what extent to mechanise and where to start? Before embarking on an expensive scheme a careful time study of all the operation cycles must be carried out and the limiting factors be established. The hourly requirements of sand and metal must be calculated. If a jobbing foundry is planned, provision for a reserve capacity for core-making and fettling will be appreciated at some later date. Reception areas for dry moulds, for castings waiting inspection and fettling must not be forgotten. These areas make the plant more elastic and less affected by the changes in the manufacturing programme. Having established the flow, the times and the weights and having reserved spare capacity for changes in manufacturing programme, by allowing 12½ per cent. for depreciation, the overheads of mechanised and non-mechanised plant could be compared. It is computed that the overheads of a mechanised moulding plant are four to six times those of hand moulding; the production, however, is six to ten times higher. The wages per ton are correspondingly lower. The first step after the selection of moulding machines must be the mechanisation of the mould transport. This can be supplemented by sand distribution plant and sand return conveyor.

It is feared that the description of foundry mechanisation which has been detailed is rather sketchy and incomplete, but it is hoped that enough has been said to let loose a polemic.

* * *

At the conclusion of Mr. Skript's Paper, which was illustrated by lantern slides, the meeting was opened for discussion. It is hoped to publish this in the JOURNAL at an early date.

(*See column 2.*)

*FOUNDRY TRADE JOURNAL, January 1, 1948.

†There is no mention of Patternmaking in "English Trades," an exhaustive book on trade openings for young men, published in its seventh edition in 1818.—EDITOR.

The Birth of a Craft

By T. R. Harris

The history of engineering is a fascinating study and the story of the development of the various sections full of interest. The recent Presidential Address* of Mr. S. A. Horton gave some very interesting details about the beginnings of the trade of patternmaking, which should be of value to students of the subject.

The researches of the present writer into the history of Cornish foundries would, however, tend to place the date of the separation of the various woodworking trades further back than the early 1870's, which were quoted by Mr. Horton.† In 1841 evidence was collected by Dr. Barham for the Children's Employment Commission, on the ironfoundries in the West of England. Attached to the Report was a table showing the number of young persons employed in the several departments of labour in the various foundries. Under the heading "Carpentry and Patternmaking," three were returned for the Copperhouse Foundry, three for Perran and 11 for Hayle. A note regarding the latter says: "Of these five are styled 'house carpenters' and six as 'engine patternmakers,'" suggesting that the two crafts were separate. Among those from whom evidence was taken, one, John Nobb, was examined on August 21, 1841:—"Is 15; has been working here (Perran) three years and a half. Is employed as a patternmaker. Is hired by the men in the shop. His father works in the same line. Easy patterns are given him to make such as he is thought to be equal to. He has nothing to do with the furnaces, and only comes at all near them when he carry in the patterns. He always works by day. The hours are from 6 to 6, with an hour and half for meals. When he began to work he earned 1s. 6d. a week; he continued at that rate of wages for six months. Afterwards they were gradually increased to 3s., which he gets at present." A note reads: "The patterns, in the making of which this boy assists, are constructed of wood, and the work in this department is not materially different from that of a carpenter or joiner."

An advertisement in the "West Briton" for August 29, 1840, reads: "Wanted immediately at the Redruth Hammer Mill Foundry, a patternmaker; application to be made at the works." The Marriage Registers give information as to the trades of the bridegroom and the bride's father, and in August, 1847, one Richard Ingram, aged 24 years, was styled "patternmaker" in the Register of the Copperhouse Methodist Church. These examples, among many others, tend to support the opinion that at least in one locality, patternmaking had evolved as a distinct trade over a century ago.

That machinery of sorts was being introduced into patternshops in the "seventies" is suggested by a news item in a local paper for July, 1874:—"A lad, when in the act of cutting off a piece of timber with a circular saw in the patternmaking department of Messrs. Harvey & Company (Hayle), was injured by a piece flying from the saw and striking him with great force in the forehead."

(*Footnotes in column 1.*)

Book Reviews

Isometric Drawing Explained. By G. H. Pearson. Published by the Bentley Publishing Company, 31, King Street West, Manchester, 3. Price 2s. net.

The reviewer is conscious of the fact that not all line drawings illustrating the making of moulds, cores and castings are perfect. He realises that much improvement has been shown during the last decade, but it must be confessed that some which he receives are not very good and cause difficulty in the art department. He would like the contributors of small practical articles to buy this little book, as he is sure it would help many, but not all of them, to produce better sketches. The little book, which runs to 38 pages, is particularly well written and clearly illustrated.

Unit Heaters, by S. E. Nelson. Published by Emmott & Company, Limited, 31, King Street West, Manchester, 3. Price, 1s. 6d. net.

This 24-page booklet, divided into three chapters, is of exceptional interest in these days of industrial good housekeeping. The book first details the types available, then it sets out the applications, and finally covers accessories and installation. The choice is wider than a cursory examination would reveal, and because of this, the reviewer recommends its purchase by those responsible for shop air-conditioning and heating.

Internal Stresses in Metals and Alloys, a collection of Papers presented at a symposium organised by The Institute of Metals. Published by the Institute from its offices at 4, Grosvenor Gardens, London, S.W.1. Price 5s. post free.

No fewer than 36 Papers are included in this symposium. These range from the highly theoretical to the severely practical. Most types of common alloys are covered, but the wider aspects have not been forgotten, for there is one Paper on glass. Castings, welds and electro-deposits all come up for consideration.

B.C.A.S. Handbook on Pneumatic Equipment. Published by the British Compressed Air Society, 94-98, Petty France, London, S.W.1. Price 20s.

The reviewer was long conscious of the variety of industrial applications of compressed air, but his knowledge has been distinctly widened by the perusal of this extremely interesting and well written book. Compressed air is to-day almost indispensable in the foundry; blowing of furnaces, the making of moulds by either rammers or moulding machines, core blowing, chipping, shot-blasting and enamel spraying are amongst the major applications, though there are others. The book describes, but not too technically, the plant available for using compressed air. Its usefulness could be increased by the inclusion of some notes on installation and maintenance. The technical section is followed by the setting out of the data to be specified to ensure proper quotation by suppliers. Finally, there are some 50 pages of unified, non-illustrated advertisements. V.C.F.

Publications Received

An Apprenticeship Scheme. Published by the Railway & General Engineering Company, Limited, Nottingham.

This brochure is particularly well written, but is devoid of illustration, which omission the reviewer deems to be a mistake. The best feature is the realisation by the compiler that many boys have an innate desire to become engineers, and, using this as a basis, a clear-cut scheme is set out as to just how this is accomplished. Rightly the money side is not stressed—in fact, it is stated that the local rates are paid. The scheme includes part-time day training, plus evening studies. There is a recognition that not all entrants can be trained for the higher executive posts, but those showing special aptitude will be given ample opportunities. A letter from the general manager accompanying the brochure states that the response to the scheme which was launched last June has been satisfactory, except for the foundry. The reviewer suggests that until this need is satisfied it would be as well to take applicants into the foundry before visiting the other shops, and therein, by using simple psychological methods, make this the main object of interest. It can be done!

Nickel Cast Iron. Issued by the Mond Nickel Company, Limited, Grosvenor House, Park Lane, London, W.1.

This attractive loose-leaf booklet bound in maroon rexine is a further edition of the well-known Nickel Cast Iron Data Book, which was first published in 1939. In clear language it gives the foundryman detailed methods for the production of nickel cast irons, together with notes for the efficient running of his cupolas and sundry tabulated information. The reviewer suggests that a section carrying data for Engineers or a reference to other publications giving such matter would round off a very useful book.

New Catalogue

Fluorescent Lighting.—The latest publication (A.163) from Philips Electrical, Limited, describes fluorescent industrial lighting fittings for 40-W. 4-ft. lamps; in 12 pages it gives general technical information on each type of fitting, together with installation features, mounting data and many diagrams and illustrations showing the dimensions and general appearance of the fittings. Each fitting is available for one of three A.C. 50-cycle voltage groups (200-210 V., 220-230 V. or 240-250 V.). No change in connection is necessary for either of the two voltages for which each set of apparatus is suitable.

The catalogue is available to our readers on application to the Lighting Department, Century House, Shaftesbury Avenue, London, W.C.2.

THE IDEAL HOME EXHIBITION is to be held at Olympia from March 2 to 25.

The Manufacture of Some Large Castings for Marine Engineering*

By D. H. Young

(*Continued from page* 33.)

GEAR CASE

The patterns for a gear case are shown in adjacent pits in Fig. 23, from which it will be seen that the bottom half of the pattern is of the block type and the top a combination of block and skeleton. The construction of the bottom half will first be described.

Fig. 24 is a close-up of the pattern, bedded down in the pit. Bearing in mind loose pieces, such as flanges, and ramming course upon course, the stage seen in Fig. 25 is reached, where a start has been made upon the necessary drawback forming the main stools. These completed, the main centre core is proceeded with, and again, due to mass and weight, a bottom plate and suitable lifters are provided; these are seen in Fig. 26.

The main core plate is also in position, and again in the arrangement of the core irons, the intelligent anticipation in allowances made to cope with contraction stresses will be seen. The main core completed, the pattern is drawn and the mould finished and blackwashed. The mould is then dried.

Fig. 27 shows the first closing operation, with the bearing in the way of the stools cored up. The lightening cores are placed between the outer and inner walls of metal, at each end of the case.

In Fig. 28 they are shown in position. After cleaning up all is ready for the reception of the main core. It will be seen from Fig. 29 how massive is this core, and why the heavy lifting plate is required. The coring is now completed and the job is ready for the top.

*A Paper read before the Scottish Branch of the Institute of British Foundrymen, of which the Author is a past-president.

FIG. 23.—GEAR-CASE PATTERNS IN ADJACENT PITS.

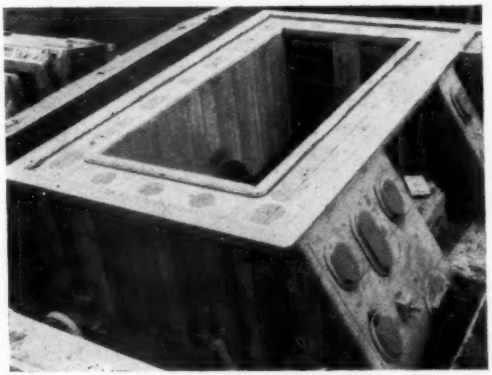

FIG. 24.—GEAR-CASE, BOTTOM HALF. VIEW FROM FORWARD END, LOOKING AFT.

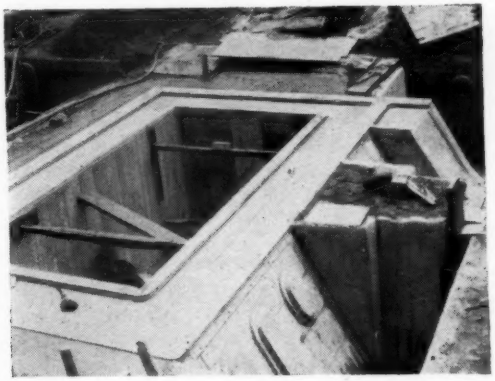

FIG. 25.—GEAR-CASE, BOTTOM HALF. VIEW SHOWING SIDE DRAWBACKS FROM AFT END.

Manufacture of Large Castings

FIG. 26.—GEAR-CASE, BOTTOM HALF. MAIN CORE PLATE IN POSITION.

FIG. 27.—GEAR-CASE, BOTTOM HALF. CLOSING VIEW NO. 1.

FIG. 28.—GEAR-CASE, BOTTOM HALF. CLOSING VIEW NO. 2.

FIG. 29.—GEAR-CASE, BOTTOM HALF. CLOSING VIEW NO. 3.

Fig. 30 gives an excellent view of the job at this stage. The metal thickness has been checked by clays and chaplets are in position to prevent the flotation of cores. Observe the hollow centre of the main core, to allow for contraction. All is now ready for the top part; this in position, the job is bound and Fig. 31 shows it ready for casting. Two runner basins are used and 26 tons of metal are required.

The casting takes 1 min. 28 secs., and in Fig. 32 is shown the run-off. The finished casting is seen in Fig. 33. This casting weighed 16 tons 10 cwts. 2 qrs. To produce it, there was spent 696 hrs. of moulding time and 130 hrs. in closing, a total of 826 hrs.—seven weeks for three men. Coremaking occupied 290 hrs. The second casting weighed 16 tons 9 cwts. 1 qr.

FIG. 30.—BOTTOM-HALF GEAR-CASE. READY FOR THE TOP.

FIG. 31.—BOTTOM-HALF GEAR-CASE. READY TO CAST.

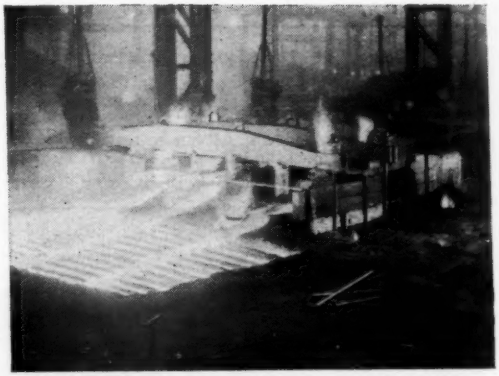

FIG. 32.—BOTTOM GEAR-CASE. CASTING OPERATION.

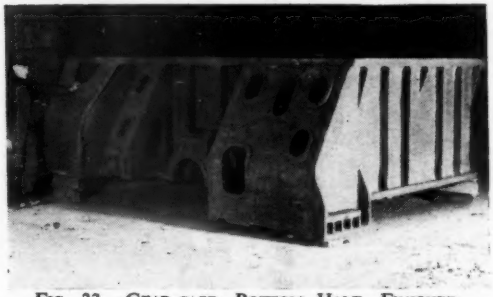

FIG. 33.—GEAR-CASE, BOTTOM HALF, FINISHED CASTING.

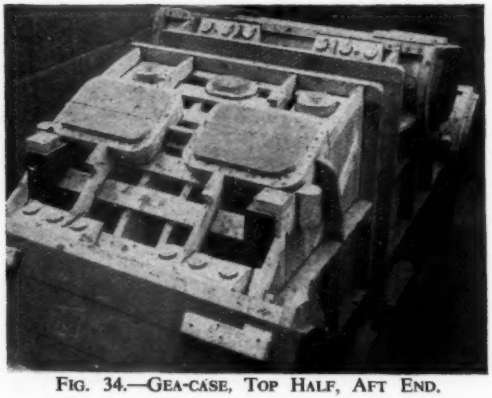

FIG. 34.—GEA-CASE, TOP HALF, AFT END.

Manufacture of Large Castings

Gear Case—Top Made in Two Parts

It is now proposed to follow the construction of the two parts, forming the top of the gear case, the bottom part of which is shown in Fig. 33. The patterns being in position and bedded, are, as can be seen in Fig. 34, a combination of block and skeleton. One half of the casing carries the bearings for both the high-pressure and intermediate-pressure shafts, the other half carries the low-pressure shaft. This can be seen in Fig. 35, which shows the ramming-up of the sides commenced. When the side drawbacks and main core are made, the stage seen in Fig. 36 is arrived at. Here the mould has been finished and dried, in readiness to start closing.

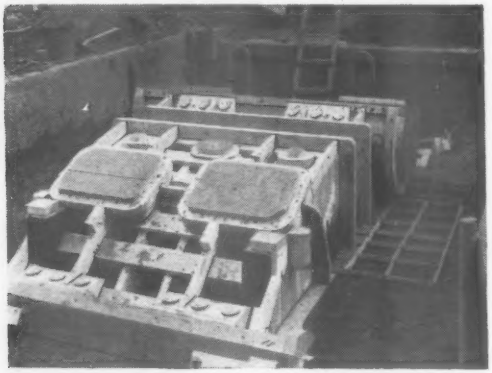

FIG. 35.—TOP-HALF GEAR-CASE MOULD, SHOWING SIDES PARTIALLY RAMMED UP.

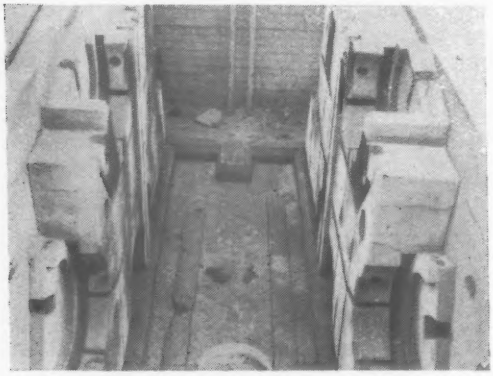

FIG. 36.—TOP-HALF GEAR-CASE, STARBOARD END, SHOWING WHEEL RACE CORES IN POSITION.

From this picture, a very clear idea is given of how much is dependent on a highly skilled and ever-alert craftsman. Consider the loose pieces that have had to be left free, and what trouble would ensure if they were neglected.

This job is largely a matter of coring, which is commenced by placing the main core (Fig. 37).

This illustration shows once again the large mass of material calling for intelligent planning as regards lifting plates, etc., at the same time taking the necessary

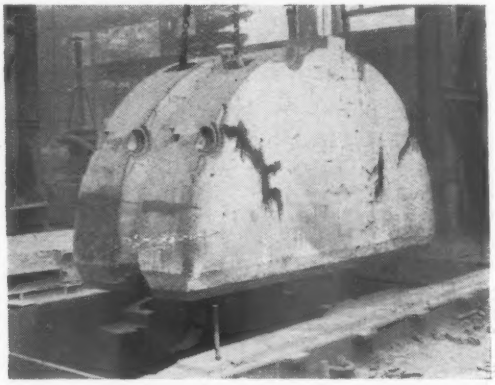

FIG. 37.—GEAR-CASE, TOP HALF. MAIN CORE OVER POSITION.

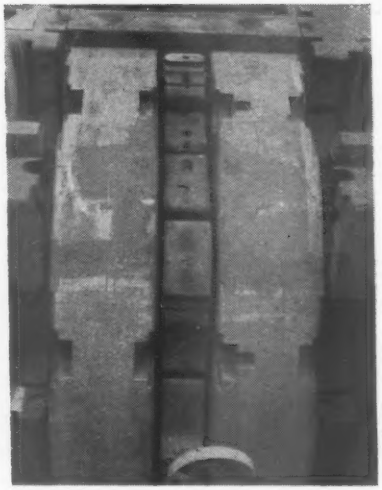

FIG. 38.—TOP-HALF GEAR-CASE, STARBOARD END. HOUSING CORES IN POSITION.

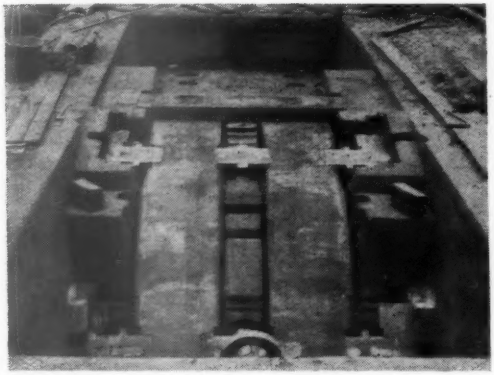

FIG. 39.—TOP-HALF GEAR-CASE, PLACING OF CORES FOR PINION BEARINGS.

precautions that such a mass, when built for handling, will yield sufficiently when contraction takes place.

The next step is to place the cores forming the housings in position; these are seen in Fig. 38. Plodding steadily on, the cores forming the pinion bearings are placed (Fig. 39). The top part (Fig. 40) is a beautiful bit of work. The top in position, the job is bound and cast. A matter of 16 tons of metal are used and the time for casting taken is 1 min. 20 secs. The casting is seen in Fig. 41.

On this job three men were employed for 13 weeks. Moulding and coremaking accounted for 1,420 hrs., 172 hrs. (nine days) of which were spent in closing. The halves weigh 5 tons 3 qrs. and 4 tons 2 cwts. 3 qrs. respectively, a total of 9 tons 3 cwts. 2 qrs.

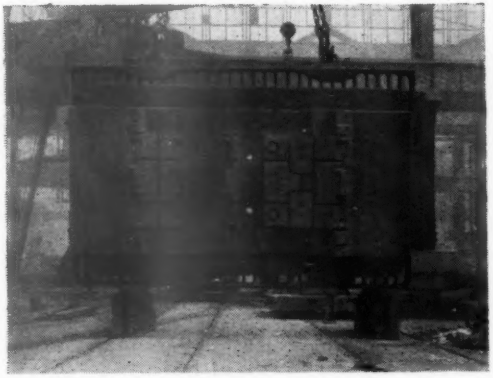

FIG. 40.—TOP GEAR-CASE, TOP PART.

Conclusion

In this Paper an endeavour has been made to show, without going into a mass of detail, these examples of the craft of the moulder. It would be an easy task if all that had to be done was to fashion sand into different shapes and make it look pretty, but it is the work of a craftsman to fashion the mould with knowledge and skill, to make it strong to withstand, and weak to yield; a fit vehicle to bring into being the designer's creation.

In conclusion, the Author expresses his thanks to Mr. Wallace, manager of Clyde Foundry, for his permission to present this Paper and for his encouragement; and to those colleagues of the foundry floor, foremen, assistant foremen and men, whose co-operation has made the task an enjoyable one; and, above all, to Mr Maxwell Bryce, who in addition to his skill as a moulder, has been responsible for the excellent photography and preparation of the slides. His enthusiasm and interest in the work has made the preparation of the Paper easy for the Author and, it is hoped, of interest to the reader.

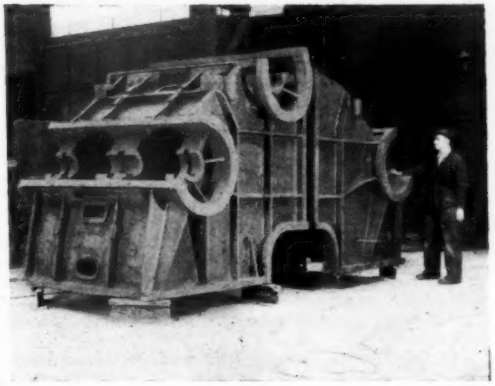

FIG. 41.—FINISHED GEAR-CASE CASTING, TOP HALF.

New Service Available to Industry

A service (Gamma Rays, Limited, of Foundry Lane, Smethwick, Staffs.) is now available for the use of manufacturers, and industrialists wishing to use the latest methods of non-destructive examination for the location and identification of all types of internal flaws in all metals and metal structures. This Gamma Ray Service is entirely self-contained, taking its own dark room and film processing unit to each works as required, and the cost of these examinations compares very favourably with the charge for X-ray work on much thinner sections.

Wild-Barfield's Indian Subsidiary

Wild-Barfield Electric Furnaces, Limited, Watford, announce the formation of Indian Wild-Barfield Company, Limited, which has been set up to cover sales and service of standard Wild-Barfield furnaces and equipment in the dominions of India and Pakistan and adjoining countries, and to carry out assembly and other constructional work as occasions demand. The new company has offices at Fort Chambers, 6-10, Dean Lane, Hammam Street, Fort, Bombay. The local management is under the control of Mr. R. A. P. Misra, who recently returned to India after a prolonged stay in England, during which he gained a thorough knowledge of the design, construction and practical uses of Wild-Barfield furnaces.

Indian Wild-Barfield Company, Limited, has been appointed sole distributor and agent for the productions of G.W.B. Electric Furnaces, Limited, Dudley, Worcs.

For many years Wild-Barfield's interests in the Indian field have been in the hands of Alfred Herbert (India), Limited, and the formation of Indian Wild-Barfield Company supplements rather than supplants the long period of co-operation.

Steelworks' Need of Scrap

The steel industry had hit its target for 1947, but if it was to hit the much more difficult target for 1948, it would need more scrap than it had been getting, said Mr. H. A. Marquand, Paymaster-General, at Cardiff on January 4. It had had to run down its stocks of pig-iron and scrap to low levels. "I want to emphasise the importance of the industry's present drive for the collection and prompt return of industrial scrap to the steelworks," he added.

Mr. Marquand said he urged all works to clear every available pound of scrap, especially heavy scrap, and return it to the steelworks. Our future output of steel depended on it.

It was announced in Frankfurt last week that Britain will receive 100,000 tons of German iron scrap in the first quarter of this year, according to an agreement concluded between the Western German steel industry and the bizonal economic control authority.

Increases of Capital

Details of increased capital have been announced by the following companies:—

Fire & Safety Engineers, Limited, Bristol, increased by £3,000, in £1 shares, beyond the registered capital of £2,000.

Precision Engineering Company (Reading), Limited, increased by £6,300, in £1 ordinary shares, beyond the registered capital of £700.

JOSEPH L. THOMPSON & SONS, LIMITED, Sunderland, have received an order from the Athel Line, Limited, for a 12,500-ton motor tanker.

Chrome Ore and Concentrates

Revised Selling Prices

The following selling prices for chrome, which include carriage charges to nearest rail point consumers' works, apply for despatches effected as from January 1. Prices are per ton, ex ship, quotations per ton, ex store, being given in parentheses:—

Refractory grades: Rhodesian Imperial grade, £9 18s. 6d. (£11 1s.); Transvaal 1st. grade (basis 42 per cent., scale 1s. 6d.), £7 17s. 6d. (£8 19s.); Indian (basis 40 per cent., scale 1s. 6d.), £9 2s. 6d. (£10 4s.); Turkish grade I, £9 12s. 6d. (£10 15s.); Philippine, £7 11s. (£8 13s.).

Metallurgical grades: Rhodesian lumpy metallurgical, £10 (£11 2s.); Baluchistan, £10 7s. 6d. (£11 9s.); Rhodesian washed concentrates, £10 4s. (£11 9s. 6d.).

Chemical grades: Rhodesian Dyke chemical, £10 (£11 1s. 6d.); Transvaal chemical A grade concentrates (basis 48 per cent., scale 2s. 6d.), £9 12s. (£10 17s.); Transvaal B grade (basis 48 per cent., scale 2s. 6d.), £9 6s. (£10 11s.); Transvaal C grade (basis 46 per cent., scale 2s. 6d.), £8 19s. (£10 4s.); Transvaal D grade (basis 44 per cent., scale 1s. 6d.), £7 16s. (£9 1s.); Baluchistan, £10 7s. 6d. (£11 9s.).

Advertising Circulars

The Board of Trade has issued the Control of Paper (No. 84) (Economy) Order, 1947, (S.R. & O. 2717), which reduces the quantity of advertising circulars (other than advertising circulars in connection with pool betting schemes or theatre circulars) which a person may distribute free of charge in any period of three consecutive months, from 20 per cent. to 10 per cent. of the weight of such circulars distributed by him free of charge in the corresponding period of three months in the year which ended on August 31, 1939. The restriction is caused by the increasing need for economy in the use of paper.

At the same time, in connection with the proposal dropped from the Finance Bill to disallow, for tax purposes, half the expenditure on certain kinds of advertising, a sub-committee has been appointed by the working committee of the Federation of British Industries to prepare a scheme for the voluntary reduction of advertising expenditure.

Gazette

MACHINERY (SMITH'S PATENTS), LIMITED, is being wound up voluntarily.

CURZON CASTINGS, LIMITED, is being wound up voluntarily. Mr. R. G. Wallis, 69, Fleet Street, London, E.C.4, is the liquidator.

THE WEAR'S LAST LAUNCH of 1947 was a 2,400-ton wine ship built by Wm. Pickersgill & Sons, Limited, Sunderland, for French owners.

Personal

MR. R. S. PORTHAM has retired from the board of the Superheater Company, Limited, Manchester.

MR. G. P. ROBERTS has been appointed a technical director of Guy Motors, Limited, Wolverhampton.

MR. H. V. REDSHAW has been appointed managing director of the Crane Foundry Company, Limited, Wolverhampton.

MR. JOHN TEMPERLEY has been appointed a director of Bentley & Jackson, Limited, paper makers' engineers, ironfounders, etc., of Bury.

MR. H. J. RANDALL, chairman of the British Electrical Development Association, has been appointed chairman of the London Area Electricity Board.

DR. P. DUNSHEATH, who has been appointed a member of the London Area Electricity Board, is a past-president of the Institute of Electrical Engineers.

MR. L. COPELAND WATTS has been nominated by the Council of the Institution of Heating and Ventilation Engineers as president of the institution for 1948.

COL. J. S. A. WALKER, a director of Walker Bros. (Wigan), Limited, colliery engineers, etc., has been appointed a member of the North-Western Area Electricity Board.

MR. HENRY FOXWELL SHERBORNE, who has been appointed a member of the Yorkshire Area Electricity Board, is managing director of Yorkshire Copper Works, Limited.

MR. G. A. LEMON has been appointed a director of Baker Perkins, Limited, manufacturing engineers, etc., of Peterborough. He will act as joint works manager with Mr. Gordon Lewis.

MR. H. KIRMAN, a director of Baker Perkins, Limited, manufacturing engineers, of Peterborough, left for Australia recently to carry out a six months' survey of the company's organisation there.

MR. W. LIONEL FRASER has been elected a director of Tube Investments, Limited, and appointed a deputy chairman. SIR EDMUND CRANE, who is to visit South Africa, has resigned from the board.

MR. C. F. RUSSELL has been elected chairman and managing director of Specialloid, Limited, piston manufacturers, non-ferrous founders, etc., of Friern Park, London, N.12, in succession to MR. H. N. BATES.

MR. JAMES T. GRAHAM, who has been appointed a member of the East Midland Area Electricity Board, is the general manager of Worthington-Simpson, Limited, pumping machinery manufacturers, of Newark.

MR. BASIL CURRAN, of Edward Curran & Company, Limited, structural engineers, ironfounders, etc., of Cardiff, and associated companies, has been appointed a member of the South Wales Area Electricity Board.

MR. J. B. MAVOR, chairman of Mavor & Coulson, Limited, engineers, of Glasgow, and a director of the Royal Technical College, Glasgow, has been appointed a member of the South-West Scotland Area Electricity Board.

MR. E. J. STRICKLAND, assistant traffic manager of C. A. Parsons & Company, Limited, engineers, turbine manufacturers, of Newcastle-upon-Tyne, has retired at the age of 70. He has been associated with the company for 40 years.

MR. H. P. R. SCOTT, Director of Steel Castings and Drop Forgings for the Ministry of Supply during the war, has been appointed joint managing director of Thomas Summerson & Sons, Limited, Darlington, and Summerson Foundries, Limited, Spennymoor.

MR. F. B. RICHARDS, chairman of the Woodall-Duckham Company, sailed for South Africa on January 1. The company has under construction for the South African Iron & Steel Industrial Corporation, Limited, coke-oven and by-products recovery plants valued at over £2,250,000.

MR. W. D. MADDEN, chairman and managing director of Hick, Hargreaves & Company, Limited, engineers, ironfounders, etc., of Bolton, has been appointed to serve on the North-Western Regional Board for Industry, from which SIR FREDERICK WEST has resigned his position as vice-chairman.

MR. W. W. MACARTHUR has been appointed managing director of Air Ducts, Limited, Brentford, the principal subsidiary of Richard Crittall & Company, Limited, heating and ventilating engineers, etc. He has also been appointed executive director of the Glasgow factories of Richard Crittall & Company.

MR. ROBERT JONES, head foreman, and MR. JAMES A. BARKER, chief of the rate-fixing department of Glenfield & Kennedy, Limited, hydraulic engineers, etc., of Kilmarnock, have received presentations to mark their retirement at the end of last year. Mr. Jones had been with the company for 57 years and Mr. Barker for nearly 25.

MR. A. E. COOPER, assistant works manager of Aveling-Barford, Limited, road machinery and earth-moving equipment manufacturers, of Grantham, and manager of Banes Plant Hiring Company, Limited, an associated company, has retired at the age of 57 owing to ill-health. He has been associated with the company for 35 years.

MR. F. C. HITCHES has resigned from the board of Milner's Safe Company, Limited, Highgate Village, London, N.6. MR. B. B. DYER is now sole managing director and MR. R. UNDERWOOD has been appointed secretary of the company. MR. F. WHITEHEAD has been appointed general works manager of the factory at Speke, Liverpool.

MR. H. COUSINS, publicity manager of the British Aluminium Company, Limited, will be retiring at the end of January at his own request, after completing 40 years' service with the company. As a consequence of Mr. Cousins' retirement, the publicity department will be combined with the present sales research and statistical section under MR. C. G. MCAULIFFE as manager. The new department will be known as the publicity and sales research department. MR. E. G. FIELDING, who will be responsible for the publicity work of the department, will have the title of publicity officer.

Obituary

MR. ANTHONY EDMUND MAY, chief electrician of the Sheepbridge Coal & Iron Company, Limited, has died at the age of 62.

MR. WILLIAM HENRY STILLING, formerly of Isaac Braithwaite & Son, Engineers, Limited, Kendal, Westmorland, died on January 2.

MR. ROBERT HERBERT, of Galashiels, who was associated with Robert Herbert & Sons, engineers and mill furnishers, died on January 4.

MR. THOMAS NESBIT LAMB, formerly with Dobbie, Forbes & Company, Limited, ironfounders, of Larbert, Stirlingshire, died recently.

MR. JOHN OLIVER, who has died at the age of 87, formerly held an administrative position with the Stanton Ironworks Company, Limited, Nottingham.

MR. EDWARD JAMES WOODS, who was associated with C. & W. Walker, Limited, gasworks' engineers and ironfounders, of Wellington, Shrops, for nearly 60 years, has died at the age of 83.

MR. S. J. DONNELLY, who died on January 4, was chief shipyard draughtsman of Harland & Wolff, Limited, Belfast. He joined the company 48 years ago, and during the 1914-18 war was assistant manager of the Govan yard.

MR. JOHN MURRAY MARTIN, formerly of Hugh Martin & Sons, ironmasters, of Coatbridge, Glasgow, died recently at the age of 70. Mr. Martin retired when the company was taken over by Bairds & Scottish Steel, Limited.

MR. ALFRED CHARLES BLENCOWE, office manager at the Wilden Works, Stourport, of Richard Thomas & Baldwins, Limited, was killed in a road accident recently. He was 59 years of age and had been in the service of Baldwins, Limited, for 42 years.

MR. JAMES H. DAVIE, one of the oldest members of the iron and steel trade in Glasgow, died recently. He joined the firm of Paul & Alexander 61 years ago. In 1896 he became manager of Paul & MacLeod, iron, steel and tinplate merchants, of 82, Gordon Street, Glasgow, and in 1939 he was taken into partnership by Mr. George A. Paul.

MR. TREVISA CLARKE, managing director of the North of Ireland Shipbuilding Company, Limited, under Swan, Hunter & Wigham Richardson, Limited, Wallsend, from 1909 until the winding up of the company in 1927, died recently at the age of 83. Mr. Clarke was a member of the North-East Coast Institution of Shipbuilders and Engineers.

MR. ARTHUR SHORE, who died recently at the age of 78, had been associated with engineering all his life. He was the last surviving partner of Thomas Shore & Sons, Limited, engineers, before the business was transferred, in 1933, to the Etruscan Engineering Company, Limited, ironfounders, etc., of Stoke-on-Trent. He later acted as their representative.

MR. WALTER LAYCOCK MITCHELL, who died on New Year's Day, retired last summer from his position as secretary of Jonas Wells, Limited, brass and iron founders, etc., of Keighley, Yorks, which he had held for over 25 years. He had actually spent more than 40 years with the firm, having started his career there as a junior in 1906. He succeeded his father, the late Mr. A. Mitchell, as secretary. Mr. W. L. Mitchell was 57 years of age.

MR. W. CORTON, for many years West of England technical representative with Gent & Company, Limited, manufacturing electrical engineers, of Leicester, died recently at the age of 74. He had been with the company for 54 years. He was a member of the sub-committee of the British Standards Institution dealing with intrinsically safe apparatus. Mr. Corton was prevented through ill-health from taking office on his election as president of the Leicester Association of Engineers, of which body he had been a member for many years.

Recent Wills

HILL, ALEXANDER, ironfounder, of Pollokshields, Glasgow	£24,355
WINIBERG, FREDERICK, for many years teacher at the Science School, Penzance	£1,011
MCLEAN, T. J. B., managing director of the Parker Foundry (1929), Limited, Derby	£80,160
JONES, ROBERT, engineer of the Brixton & Clapham Ball Bearing Company, Limited	£13,253
STEPHENS, W. C., founder and a director of the Climax Rock Drill & Engineering Works, Limited ...	£41,842
CLARK, THOMAS, of East Kilbride retired clerk, for many years with Stewarts and Lloyds, Limited ...	£8,311
SEELEY, ALFRED, for many years a director of Thomas Holt, Limited, textile engineers, of Rochdale ...	£68,825
SIMON, F. R., a director of Richard Simon & Sons, Limited, manufacturers of drying machinery, etc., of Nottingham	£57,024
MCINTOSH, STEWART, of Monkseaton, Northumberland, North-East Coast agent for Whessoe, Limited, gas-plant engineers, etc., of Darlington	£6,265
CROSLEY, WILLIAM, for 44 years on the staff of W. C. Holmes & Company, Limited, gas and chemical engineers, ironfounders etc., of Huddersfield ...	£9,631
TRINHAM, J. S., a director of N. Hingley & Sons, Limited, Netherton Iron Works, Netherton, Dudley, Worcs, a former president and chairman of Birmingham Iron Exchange, and chairman of the Midland Iron and Steel Wages Board ...	£10,638

Purchase Tax on Heating Appliances

The Treasury has made an Order (the Purchase Tax (Alteration of Rates) (No. 3) Order, 1947) exempting from purchase tax domestic space-heating appliances incorporating electric fans or electric pumps which consume not more than 100 watts. The intermediate rate of 75 per cent. tax will no longer apply to space-heating and water-heating appliances which, although operating from electric or gas mains, do not use electricity or gas as the source of heat. Some of them will be taxable at the basic rate of 50 per cent. of the wholesale value and others will be exempt from tax.

News in Brief

EXPORTS OF non-ferrous metals from Canada to Britain during 1947 were greater than the average for the 10-year period ended 1946.

ROBERT STEPHENSON & HAWTHORNS, LIMITED, Newcastle-upon-Tyne, are to build 80 shunting locomotives of the 0-6-0 type for the G.W.R.

THE NAME OF Harrison & Crates, Limited, marine and general engineers, etc., of Battery Green, Lowestoft, has been changed to William Overy & Son, Limited.

SWAN, HUNTER & WIGHAM RICHARDSON, LIMITED, are to widen the east building berth at their Neptune Yard, Walker-on-Tyne. The launching ways will also be widened by additional rows of piling.

S. WALKER & SONS (MANSFIELD), LIMITED, ironfounders, is celebrating its centenary. Three generations of the family have carried on the business since Mr. Samuel Walker founded it on its present site.

A MACHINE FOR assembling 330 radiator cores in 9½ hours, cutting production costs and scrap wastages by 50 per cent., and which can be operated by only three men, has been designed by Ford workers at Dagenham.

A CARGO OF 4,000 tons of zinc concentrate which is to be shipped to Swansea from Carthagena, Spain, is expected to be the forerunner of several similar cargoes. The zinc will go to the National Smelting Company's works in Glamorganshire.

NEWMAN INDUSTRIES, LIMITED, electrical and mechanical engineers and manufacturers, of Bristol, give notice that the £12,735 6 per cent. redeemable convertible cumulative preference stock is to be redeemed at 22s. per £1 of stock on April 1.

FOLLOWING THEIR annual Christmas dinner, Mr. E. B. Hall, chairman of Hall & Pickles, Limited, steelmakers, etc., of Sheffield, presented gold watches to 22 members of the staff who have completed 25 years and over in the service of the company.

THE LILLESHALL IRON & STEEL COMPANY has been registered as a private company, with an initial capital of £100 in £1 shares. It will operate as a subsidiary of the Lilleshall Company, Limited. The object of the new company is to acquire the iron and steel trades branch of the main company.

UNANIMOUS APPROVAL has been given by separate meetings of preference and ordinary share holders of Follsain Metals, Limited, to the scheme of arrangement which provides for removal from the balance-sheet of a sum total of £105,967 out of its aggregate value at December 31, 1946, of £151,640.

THE ROLLS-ROYCE jet-engine factory at Barnoldswick may be closed early next year. A letter from the Ministry of Supply to Mr. G. B. Drayson, M.P. for Skipton, states that Rolls-Royce, in common with other aircraft firms, have to adapt their works capacity to peacetime needs, and that will inevitably mean concentrating their work at Derby.

SIR ROBERT JOHNSON, chairman of Cammell Laird & Company, Limited, said at Birkenhead last week that with the reduction of working hours output had decreased and absenteeism was now between 9 and 10 per cent. every morning. He added that if pre-war standards could be attained, nine ships could be built where they were now building six.

OWING TO HIGH COSTS and uncertain delivery dates, Ellerman Lines, Limited, have cancelled orders placed with Swan, Hunter & Wigham Richardson, Limited, Wallsend, for two vessels of 6,000 tons. Two ships ordered from William Denny & Bros., Limited, Dumbarton, and Cammell Laird & Company, Limited, Birkenhead, have also been cancelled.

THE COUNCIL OF INDUSTRIAL DESIGN announces that, during 1948, it is proposed to hold "Design Weeks" in Cardiff from April 12 to 17, in Manchester from June 21 to 26, and in Birmingham from October 11 to 16. The Council's plans have been made in co-operation with the Federation of British Industries, the Association of Chambers of Commerce and with the support of the civic authorities.

THE AUSTIN MOTOR COMPANY, LIMITED, and Crompton Parkinson, Limited, have announced that, as from January 1, Austin Crompton Parkinson Electric Vehicles, Limited, have undertaken the marketing of the "Morrison-Electricar" electric vehicles, in the main through existing Austin dealers. The sales department of the new company operates from Longbridge, the headquarters of the Austin Motor Company.

HARRIS & SHELDON, LIMITED, shop fitters and shopfront builders, of Birmingham, has been re-registered as H. & S. Holdings, Limited, and two private companies have been formed. The new companies are Harris & Sheldon, Limited, and Harris & Sheldon Metal Furniture, Limited. The formation of the new companies is part of the group's scheme for expansion following the switch from war to peace production.

ORDERS FOR SEVEN TANKERS, whose deadweight tonnages range from 12,250 to 24,500 tons, have recently been booked by the Furness Shipbuilding Company, Limited, Haverton Hill-on-Tees. They have now in hand a building programme which will keep them fully employed for at least four years, and will require an increase of 500 in their labour force. Of the 27 ships on order, 18 are tankers, the biggest of which is a 27,000-ton vessel for Norwegian owners.

DURING 1947, 123 vessels of 496,977 gross tons were launched on the North-East Coast, compared with 140 vessels of 541,561 tons in 1946. The Tyne's output was 49 ships of 202,936 tons, against 54 vessels of 197,566 tons in 1946, while the Wear's production of 46 ships of 194,114 tons was 1,500 tons less than 1946. Swan, Hunter & Wigham Richardson, Limited, Wallsend, had the biggest output of any single firm and were the only Tyne firm to record an increase in output over 1946. Of the 43,169 tons launched by William Gray & Company, Limited, West Hartlepool, 41,651 tons were for export.

Company News

(Figures for previous year in brackets.)

Boulton & Paul—Dividend of 20% (15%).

Silentbloc—Interim dividend of 12½% (same).

Spencer (Melksham)—Dividend of 12½% (10%).

Irish Aluminium Company—Dividend of 5% (same).

Bylock Electric—Final dividend of 200%, making 300%.

Parsons Engineering Company—Dividend of 25% (same).

Head, Wrightson & Company—Interim dividend of 4% (3%).

Electric Furnace Company—Interim dividend of 3½% (same).

Mitchell, Shackleton & Company—Final dividend of 5% (2½%), making 8% (2½%).

Ingall, Parsons, Clive & Company—Ordinary and deferred dividends of 10% (same).

H. M. Hobson (Aircraft & Motor) Components—Dividend of 15% (same and bonus of 2½%).

Acton Bolt—Net profit for the year ended March 31, 1947, £22,990 (£13,654); to special depreciation, nil (£3,819); written off patents, nil (£500); deferred repairs, £959 (£1,869); general reserve, £10,000 (nil); dividend of 10% (5%); forward, £19,614 (£25,115).

Wolverhampton Die-Casting Company—Trading profit for the year ended June 30, 1947, after E.P.T., £53,400 (£30,487); rents received, £178 (£622); to depreciation, £13,982 (£6,924); tax provision, £19,974 (£10,049); final dividend of 10%, making 15%; forward, £46,510 (£32,962).

Midland Bright Drawn Steel & Engineering Company—Net trading profit for the year ended October 31, 1947, £56,402; final dividend of 25%, making 45% for the period January 9 to October 31, equivalent to a rate of 55.49% for a full year; to general reserve for bad debts, £425; taxation reserve, £26,702; forward, £4,570.

Crompton Parkinson—Trading profit for the year ended September 30, 1947, after tax, £479,156 (£468,328); to depreciation, £25,000 (same); directors' fees, £3,261 (£2,965); net profit, £450,895 (£440,363); final dividend on the ordinary and "A" ordinary stock of 7½% (same) and bonus of 7½% (same), making 22½% (same); to trustees of central benevolent fund, £5,000 (same); forward, £916,297 (£797,902).

Midland Iron & Hardware (Cradley Heath)—Net trading profit to July 31, 1947, £130,619 (£71,720); dividend, etc., revenue, £13,378 (£1,774); tax reserve certificates interest, £423 (£353); to directors' remuneration and fees, £9,200 (£5,704); tax, £66,854 (£30,200); net profit, £68,365 (£37,943); to general reserve, £50,000 (nil); final dividend of 150%, less tax, making 250%, less tax (100%, tax free); forward, £152,596 (£176,586).

Richard Hill & Company—Trading profit for the year ended September 30, £110,351 (£40,672); interest on investments, etc., £134 (£108); to directors' fees, £500 (same); depreciation, £9,889 (£9,879); appropriated to write down fixed assets, £20,000 (£10,000); taxation, £52,000 (£16,000); obsolescence of plant, nil (£329); net profit, £28,096 (£4,072); final dividend of 15%, making 20% (8%); forward, £27,442 (£18,408, less additional directors' fees £500).

Heenan & Froude—Trading profit for the year ended August 31, 1947, £32,888 (£47,945); adjustments relating to previous years, £29,061 (£42,243); bad debt recovered, £348 (£5,490); provision for inventory adjustments, nil (£23,451); dividends from subsidiary companies, £40,000 (£43,049); other income, £216 (£253); to depreciation, £15,320 (£15,645); superannuation fund, £5,627 (£5,124); interest and charges, £825 (£1,055); directors' fees, £1,350 (£1,850); war damage, nil (£22); net profit, £86,820 (£97,434); to taxation, £50,670 (£60,290); preference dividend, £4,391 (nil); final ordinary dividend of 10%, making 15% (20%, including bonus of 5%); forward, £17,266 (£12,344).

New Companies

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

B.T.E. (Bradford), 1a, Manor Row, Bradford—Engineers, etc. £20,000. R. W. Short, B. Taylor, and L. Boyden.

Febroden, Stockport Road, Denton, Lancaster—Iron and brass founders, etc. £2,000. J. Dunning and T. Mitchell.

Fred Hardy (Huddersfield), Upper Bankfield Mills, Moldgreen, Huddersfield—Patternmakers. £5,000. F. and G. Hardy.

E. J. Philpott's Metalworks, Chapman Street, Loughborough—£4,000. E. J., A., and L. J. Philpott, and G. R. Padmore.

F. Prime & Son, 159, Aston Brook Street, Birmingham—Iron and brass founders, etc. £1,000. G. F. and D. F. Prime.

F. & E. Billingham, 151, Estcourt Road, Gloucester—Metal and machinery merchants, etc. £5,000. F. W. and E. H. Billingham.

Willenhall Tube & Forging Company, West Midland Works, Walsall Road, Willenhall—£5,000. P. R. Slyde and J. M. Terry.

Wiven Manufacturing Company, 199, Piccadilly, London, W.1—Ironfounders, etc. £10,000. W. S. Waylett and E. Bridge.

Cheltenham Pattern Making Company, Alma House, Rodney Road, Cheltenham—£2,000. F. McKenna, S. Russell, and J. Thompson.

A NEW BLAST FURNACE at the Clyde Iron Works of Colvilles, Limited, came into operation last Monday. The lighting of the furnace was delayed owing to shortage of coke.

Save Fuel

IN YOUR CUPOLAS
BY USING
STANTON
HOLWELL
or RIXONS
SAND-LESS
MACHINE CAST
PIG IRON

THE STANTON IRONWORKS COMPANY
LIMITED NEAR NOTTINGHAM

Raw Material Markets

Iron and Steel

Pig-iron production is steadily increasing and the average weekly output is now at the highest level since 1918, but is still short of current requirements. About 60 per cent. of the pig-iron produced is going directly into consumption in the steel furnaces, and the foundries, whose requirements are exceptionally heavy, are still on short commons. Hematite production has been substantially increased, but there remains a definite shortage of ordinary foundry iron which calls for immediate redress. The foundries have an abundance of work in hand and are in a position to make a material contribution to the export drive. But they cannot attain full production unless they get more pig-iron and/or more scrap.

Regular deliveries of semis from the British steel plants suffice to maintain the recent scale of activity in the re-rolling industry. But this is well below capacity limits. With more liberal supplies of billets, blooms, etc., much bigger outputs of re-rolled material—for which there is an inordinate demand—could be achieved. Very meagre tonnages of imported material are available for distribution and, although efforts to secure bigger supplies from the U.S.A., the Dominions, and Continental sources have not been relaxed, there seems to be no early prospect of expansion in this direction. The shortage of sheet bars also tends to limit the output of light sheets, although good tonnages of slabs are reaching the mills.

All the finishing mills are heavily booked for the first half of this year, and in some instances bookings extend into the second half. The congestion of orders points clearly to the need for the overhaul of allocations, and producers, as well as consumers, welcome the new measures to establish a closer relationship between authorised tonnages and current outputs. Bigger tonnages of steel have been allocated to the motor industry. Shipbuilders have also been encouraged to expect more steel in the current year, and if P.M.L. requirements are not reduced, other consumers are likely to fare badly.

Non-ferrous Metals

There cannot be much doubt that the non-ferrous metal traders were surprised when the Ministry of Supply announced a further increase in the price of tin. This time it was a mere £9, but it brings the quotation to £519 per ton, at which level there will undoubtedly be a tendency to do without this metal altogether, so far as that is possible. Refined tin, 99.75 per cent. minimum purity, now costs £522 10s. per ton, and yet it is reported that the Malayan interests, at any rate, are dissatisfied with the situation. In some ways they certainly seem to have had a hard deal, for while the Ministry has advanced its buying price to Nigerian producers from £477 to £485 10s. per ton, no equivalent alteration has been seen in the figure paid to Malaya. But the user of tin, confronted with a valuation never hitherto recorded, may well be excused if he thinks that the producer of the metal at any rate should be well satisfied. For the moment, the consumers are certainly at a disadvantage, for we have a seller's market, and there are some people who believe that another increase in price is possible. But the day will come when, with world production well in excess of a demand which has been greatly reduced by the exorbitant price, the quotation will drop catastrophically in an attempt to persuade the trade to buy. By that time it is more than likely that there will be a free market back again; this is to be hoped so, for it will at least provide the opportunity of hedging against possible losses. Since dealings in tin are not hampered by dollar-currency difficulties, there would appear to be only the question of scarcity to overcome in re-establishing a free market.

The scrap market continues to be firm, and there is a general scarcity of all types of old metal, despite the high prices ruling. These have now reached a point not achieved last year, when copper stood at £137, but at that time there was a fear that the end of the non-ferrous metal boom was not far off, for copper and zinc, at any rate, seemed to be running into a condition of ample supply. To-day all that has changed. Copper, it is true, is £5 per ton lower now than it was at one time last year, and zinc is unchanged, but sentiment, strengthened by the prospect of the Marshall plan and the stockpiling programme of the U.S. Government, is very much more inclined to see a rise than a fall in virgin prices. The huge increase in the tin quotation recorded since mid-December has, of course, strengthened gunmetal and all tin-bearing scrap, and has played its part in persuading holders of old metal that they should not be in any hurry to part with holdings. That, in fact, is what is now happening and last week's increase of ½d. per lb. in the price of brass turning rod has rather confirmed the doubters in their belief that a further rise is due soon. Brass swarf has now climbed to £86 10s. or £87, and H.C. copper wire is reported to have changed hands at £125 per ton.

THE WOLVERHAMPTON EDUCATION COMMITTEE have decided, subject to the approval of the Ministry, to spend £7,750 on the work involved in adapting Tor Lodge, Tettenhall Wood, Compton, Wolverhampton, as a hostel for students attending the proposed National Foundry College.

AN EXPLANATION regarding the absence of a Factory Inspector from an inquest at West Bromwich on Christmas Eve on a man who died from silicosis has been made by the coroner, who states that he is satisfied that the Inspector would have been present had he known of the inquest in time.

THE ARRIVAL IN Dublin of about 4,000 tons of coke from the United States has relieved a crisis in the foundry industry. Foundries had been managing in the past to get small supplies of coke from the United States and Holland, but these were uncertain and frequently of inferior quality.